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Addendum

Notes on dentition, cranial and body measurements of the northern White rhinoceros (*Ceratotherium simum cottoni*)

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For comparative purposes, similar measurements are presented for the endangered subspecies of the northern White rhinoceros (*Ceratotherium simum cottoni*).

Methods

Cranial measurements and dentition were recorded as above from the skulls of 6 wild northern White rhinos found dead in the Shambe area of South Sudan and Garamba National Park in northern Zaire, during a survey of the subspecies in 1983 (Hillman & Smith, 1983). They were also taken from a dead captive female at Vychodeceska Zoo, who originated from Shambe (by kind courtesy of Dr J. Safarik).

Body measurements of 8 live captive northern White rhinos of approximately known age (one measured twice at different ages) were provided by Mr M. Svitalsky and Dr J. Safarik of the Vychodeceska Zoo in Czechoslovakia. Those comparable to the measurements taken on southern White rhinos are presented here. One animal originated from Uganda, the rest from Shambe, South Sudan.

Results and discussion

The dentition and sequences of eruption and wear appear to be the same as those of the southern White rhinos and the same wear classes can be defined. There is insufficient material from known-age animals to verify whether the same ages would correspond with the same wear classes. However, the dentition of the captive female, who was estimated to have been born in 1972 and who died on 4 January 1982, is clearly that of eruption/wear stage X, which is defined

TABLE VIII
Cranial measurements (mm)

Origin	Wear class	Identification	Greatest length	Dorsal concavity	Chondylo-basilar length	Chondyles —nasals	Foramen magnum —nasals	Maxillary tooth row	Mandibular tooth row	M ¹ width	M ¹ ht. in jaw
S. Sudan (Shambe)	IV	S5				480	450	180	155		
	XI	S1		38		690		270			
	XII	S2	720			690		270			
	XII	S3	810	35		725	690	225			
Zaire (Garamba)	XI	G1	800	65	705	620	590	225	206	41.4	45.5
	XII	G2	710			600	550	270		44.0	44.0
S. Sudan (Shambe)	X	Nuri*	730	35	650			230	175	45.0	50.0

*Captive female, age at death 9–10 years

TABLE IX
Body measurements (lengths in cm, weights in kg)

Rhino names:	SUDAN	SAUT	SUNI	SUNI	NASIMA	NASI	NOLA	NADI	NESARI
Sex	M	M	M	M	F	F	F	F	F
Age	10-11 y	c. 10 y	2 y 5 m 22 d	3 y 1 m 3 d	c. 14 y	5 y 19 d	c. 9 y	c. 10 y	c. 10 y
Wt. (approx.)	1600	1400	7-800	1100	1400	1600	1400	1500	1500
Back length		266	243	243	248	260	257	245	262
Head length			103	110	105				
Tail length	85	79	79	82	79	83	74	74	82
Shoulder ht. (St.)			143	147	154	156	150	152	151
Shoulder ht. (curve)		166	159	164	164	177	168	172	176
Chest circumference	302	298	262	273	284	309	301	307	322
Belly circumference		321	289	304	315	327	325	327	
Horn length, ant.			32	39	59	46	56	45	52
Foot circ., fore		85	82	85	77	85	93	88	89
Foot circ., hind		78	75	79	73	84	89	77	81

as including ages 8-11. The degree of wear on the teeth is somewhat less than that of many wild rhinos that are in the same age class due to eruption, and pm^1 was still present. Wear would, however, be expected to vary between live and captive rhinos. In general, as far as can be ascertained, the eruption/wear classes of the dentition of White rhinos as derived from the southern subspecies appear to be applicable to the northern subspecies.

The most obvious differences between the skull measurements of the two subspecies are the dorsal concavity and the maxillary tooth row, both of which are less in the northern subspecies of the same age class, as noted by Groves (1972). The reduced dorsal concavity of the skull is clearly recognizable in live northern White rhinos. Some of the skull measurements of these northern White rhinos appear to be larger than those of the equivalent age classes of southern White rhinos, although Heller (1913) noted that northern White skulls tend to be shorter than those of southern White rhinos.

The northern White rhinos appear to be shorter and smaller than the southern White rhinos of equivalent age in most cases. The captive female 'Nasi' is believed to be a hybrid between a male of the southern subspecies and a female of the northern subspecies. Even at the age of 5 years, she is taller at shoulder height than the other captive northern White rhinos and heavier than the other females. So far, insufficient data are available from known-age infants to compare development and age determination of northern White rhinos, but field observations to date indicate a similar size relationship with the mother to that found for southern White rhinos.

Within the limitations of the amount of data available on northern White rhinos at this stage, age determination techniques developed on southern White rhinos appear to be reasonably well applicable to northern White rhinos, with the exception of certain cranial measurements.

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